



achieving results

safety

cost effectiveness



solid waste division

2000 annual report

Westinghouse Savannah River Company
Solid Waste Division
Aiken, South Carolina 29808

savannah river site
where excellence is achieved



Cover photo: Safely offloading activated carbon columns at the Effluent Treatment Facility



letter to our stakeholders

In last year's report, I anticipated that the year 2000 would again present us with many challenges. I am pleased to report that the Division has again met those challenges with remarkable success; some highlights are described below.

Safety has continued to be our top priority and we are now starting to reap the rewards of the involvement in and commitment to the Behavioral Based approach.

We have continued to improve cost effectiveness, which now stands at a 40 percent improvement over the past four years.

The volume of legacy low level waste on site was reduced for the first time in the history of the site by over 2000 cubic meters.

The TRU Ship to WIPP program met and overcame many difficulties during the year, but ultimately achieved a first-time certification audit pass; this is unprecedented across the complex, and is a measure of the commitment and high performance of all concerned.

While we were disappointed that site funding priorities necessitated suspension of the Consolidated Incineration Facility (CIF) operations, again the performance of the CIF team in effecting this suspension in a safe and efficient manner is a measure of its professionalism.

Many more achievements are described in the body of this report, including Waste Minimization successes, the continued efficient operation of the Effluent Treatment Facility, and our involvement in site-wide and complex-wide improvement projects, etc. All of these are a reflection of a motivated and professional workforce, which has in many ways, achieved our vision of being "simply the best."

We will continue to pursue this level of excellence and are now very well placed to face any challenges that the future may bring.

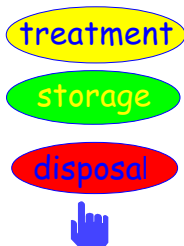
Regards,

W. S. J. Kelly
Division Vice President and General Manager
Solid Waste Division

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introduction



*Aerial view
of the
E-Area
Solid
Waste
Management
Facility*

Bordering the Savannah River, the Savannah River Site (SRS) is located on 310 square miles in central South Carolina. Managing waste activities at SRS is British Nuclear Fuels plc (BNFL) Savannah River Corporation's primary business.

BNFL manages the Solid Waste Division (SWD) at SRS, and strongly supports the site's transition from nuclear material production to national security, nonproliferation and environmental cleanup activities by managing large volumes of the backlogged and legacy wastes that exist at various facilities throughout SRS. Our goal is to eliminate legacy waste left after the Cold War Era and treat, store and dispose of newly generated waste.

As an environmental steward of SRS's waste management program, each day SWD faces the challenge of reducing the volume of waste generated sitewide and safely treating, storing and disposing of waste in the most efficient and cost-effective manner possible.

Consistent with our philosophy, SWD's major focus areas include safety, operations, customers, management systems, people and stakeholders.

Our Mission - To provide an exemplary, high quality, and cost-effective solid waste management service in support of the Department of Energy (DOE) missions at SRS and across the complex. While accomplishing our mission, we are also protecting human health and the environment.

Our Vision - To be recognized as "simply the best" in waste management practices and be an organization that the workforce is proud to be a part of.

In order to be successful, we must demonstrate our ability to rapidly adapt and continually improve the way we carry out our mission. Innovation, cost-competitiveness, safety excellence, conduct of operations, employee development and teamwork are the key to achieving that success.

Our People - Recognized as the best in their fields, our people are providing meaningful solutions for achieving our mission. Throughout this publication, the faces and actions of our people attest to their commitment to meeting SWD's vision.



*SWD
personnel
committed to
SRS's safety
culture became
Wizard of Oz
characters
(emphasizing
Pollution
Prevention) to
participate
in the SRS
Annual Safety
Conference*

relationship with our DOE Customer

treatment

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disposal



OUR DOE CUSTOMERS

The Solid Waste Division (SWD) continues to take pride in the open and trusting relationships that it has formed with its various DOE customers. During 2000, DOE was closely involved with SWD management in all aspects of planning, policy implementation, and facility performance. Routine, candid communications with DOE have resulted in close-working relationships such that expectations and feedback regarding performance are clearly shared in an expedient manner and issues promptly mitigated. Additionally, SWD remained committed to goals established by DOE, as proven by its overall performance against aggressive documented challenges.

The DOE oversight of the Ship-to-WIPP program during Fiscal Year 2000 is a prime example of SWD's close-working relationship with DOE. The DOE customers assigned to monitor Ship-to-WIPP activities were involved in all aspects of this program, from bi-weekly status meetings to scheduling issues to startup decisions. Despite initial schedule issues and other DOE concerns, effective dialog was sustained throughout the duration of Ship-to-WIPP preparation activities, such that all elements of this multi-faceted program were readily shared.



Sam Kelly, SWD, and Tom Heenan, DOE-SR, at the Supercompactor drum conveyor

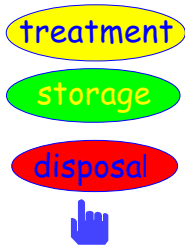
As a result, DOE understood program requirements and expectations; was able to effectively manage change in direction and focus; and facilitated removing barriers to success such that optimal performance in this program was achieved.

This mutual-trust relationship is evidenced by positive trends in DOE's periodic evaluations. Examples of significant accomplishments within the SWD, include the following DOE comments:

- "In the TRU Waste Program, WSRC and key partners completed venting and purging of all remaining TRU Waste drums two years ahead of schedule and received 33 TRU waste drums from Allied General Nuclear Services without incident.
- SWD demonstrated cost-effective approaches to using the governing regulations affecting its work activities; for example, the disposal of radioactive polychlorinated biphenyl (PCB) in the Low Level Waste vaults using the PCB Mega Rule, recently issued by the Environmental Protection Agency."



Tom Heenan, DOE-SR, Joe Buggy, WSRC, and Dick Seaborn, BNFL, visit TRU Waste's Vent and Purge operations



relationship with our DOE customer

SWD's contributions to DOE Site and complex-wide Pollution Prevention initiatives are also noteworthy. The Division's receipt of two DOE National Pollution Prevention awards, the White House Closing the Circle Award for program management leadership, as well as the Southeast Environment Management Association award provides external validation of strong performance in this area.



Tim Coffield, SWD, Karen Hooker, DOE-SR, Fran McPoland, Federal Environmental Executive appointed by President William Clinton, and Steve Mackmull, DOE-SR attend the Closing the Circle Award presentation at the White House



Steve Mackmull, DOE-SR, Tim Coffield, SWD, Dave Hepner, DOE-SR, Susan Weber and Richard Langston, DOE-HQ attend a DOE presentation during Pollution Prevention Week

Although considerable progress has been achieved in establishing a baseline level of credibility with DOE, SWD is committed to enhancing its flexibility in working with its DOE customers. With the establishment of a positive track record in several areas visible to DOE, SWD is postured to assume additional missions across the site and complex-wide. The Mound project will provide opportunities for SWD to demonstrate its leadership within the DOE complex in 2001. Timely communications and close working relationships with each of our DOE customers will continue to be the cornerstone to SWD's success in ensuring entrustment of customer confidence in SWD's ability to be "simply the best" in the waste management arena.

During 2000, SWD expanded its DOE network to include strong ties with DOE customers at other sites throughout the complex. For example, SWD:

- Partnered with two other DOE Sites (Mound and Carlsbad) to assume a significant, unplanned scope of work with regard to shipments of Pu-238 waste to SRS
- In its key leadership role in EM integration, SWD supported a DOE-HQ workshop on mixed waste disposition and assumed a lead contractor role in addressing many of the identified issues
- Developed an aggressive strategy to come into compliance with DOE Order 435.1 and shared this strategy with other DOE sites to ensure complex-wide success



Maxcine Miles, DOE-SR, Ray Hannah, DOE-SR, Sharla Barber, and Tony Maxted, SWD, and an observer address stakeholder issues

managed waste streams

treatment

storage

disposal



Most of SRS's waste is categorized as transuranic, low-level, hazardous, mixed, high-level or sanitary waste. The Solid Waste Division (SWD) is responsible for managing all of these categories except for high-level waste.

TRANSURANIC WASTE

Transuranic (TRU) waste is waste contaminated with radioactive isotopes that have decay rates and activities exceeding defined levels. It contains man-made elements that are heavier than uranium and decay slowly, thus requiring thousands of years of isolation. TRU wastes can include equipment, protective clothing and tools. In 2000, 11,000 cubic meters of legacy solid TRU waste was stored on TRU pads located at the site's Solid Waste Management Facility.

With the opening of the Waste Isolation Pilot Plant (WIPP) in New Mexico, SWD is gearing up to begin TRU waste shipments in Fiscal Year 2001. Extensive efforts are underway to develop the process, procedures, and facilities needed to meet the requirements of the WIPP Waste Acceptance Criteria (WAC) and the New Mexico Resource Recovery and Conservation Act (RCRA) Permit.



Transuranic waste stored in a covered TRU pad

LOW-LEVEL WASTE

Low Level Waste (LLW) is any radioactive waste not classified as high level or TRU waste. Examples include protective clothing, job-control waste, equipment, tools, filters, rags and papers. In 2000, 8,376 cubic meters of solid LLW were accepted for disposal. This LLW was analyzed and separated. Some of the LLW was disposed in engineered concrete vaults while selected low-activity waste is typically disposed in trenches. A long-term (10,000 years) Radiological Performance Assessment (PA) and Composite Analysis (CA), approved by DOE-HQ, demonstrates that SWD's disposal practices meet rigorous standards to protect human health and the environment.



LLW is disposed in large concrete vaults located in E-Area

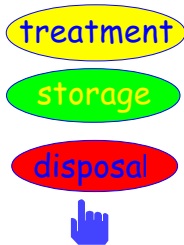
SWD operates DOE's LLW disposal facilities in accordance with DOE Order 435.1, "Radioactive Waste Management". Selecting the appropriate waste facility to send the LLW for disposal depends on the waste characterization and form. After sorting, segregating and volume reducing, some of the LLW is disposed of in large concrete vaults. Slightly contaminated soil, stabilized ash and rubble is disposed in trenches.



B-25 boxes in the E-Area Vaults

Drums in the E-Area Vaults





managed waste streams

HAZARDOUS WASTE

The Resource Conservation and Recovery Act (RCRA) defines Hazardous Waste as any toxic, corrosive, reactive, or ignitable material that could damage the environment or negatively affect human health. Some examples of SRS hazardous waste include oils, solvents, acids, metals, and pesticides. In Fiscal Year 2000, the Hazardous Waste program completed or exceeded all milestones and initiatives.

During the year, many accomplishments were achieved, including reduction of waste inventory in on-site storage from 462 cubic meters to 216 cubic meters and completing eight labpack offsite shipments totaling 1,048 containers. SWD disposed offsite 247 cubic meters of legacy waste, thus exceeding DOE's goal of 162 cubic meters. Also, disposed offsite was 159 cubic meters of contaminated soil generated at an Environmental Restoration cleanup site.



Tanker truck shipment of liquid sodium tetraphenylborate was sent to a commercial incinerator in St. Louis, MO. This chemical had been used in the In-Tank Precipitation process and was no longer needed.

MIXED LOW LEVEL WASTE

Mixed Low Level Waste (MLLW) is waste that is both radioactive and hazardous. This type of waste is subject to regulations governing both waste types.

In Fiscal Year 2000, the Mixed Low Level Waste program met all of its Site Treatment Plan (STP) commitments. The STP represents an agreement among the Solid Waste Division, the Department of Energy (DOE) and the South Carolina Department of Health and Environmental Control (SCDHEC) to properly treat SRS's mixed waste on a specific schedule. This accomplishment represents the Solid Waste Division's commitment to responsibly manage these wastes.



N-Area Hazardous Waste Storage, where 55-gallon drums of hazardous waste are stored

Another success story began with disposal operations for chemicals stored by the High Level Waste Division (HLW) at the Holley Oak Chemical Company in Fountain Inn, S.C. SWD accomplished this task by managing and implementing the offsite disposal of 730 drums of solid waste, 25,000 gallons of liquid sodium tetraphenylborate waste, and three tankers of rinsate. Disposal of these materials resulted in significant storage cost savings for the HLW Division.



Luke Reid and Oscar Henderson, SWD, discuss Hazardous Waste Storage

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SANITARY WASTE

Sanitary Waste (SW) includes both non-radioactive municipal waste (office waste, food, garbage, refuse and other solid wastes that are similar to those generated by most households) and industrial waste (construction debris, scrap metals, wood waste, etc). During the year, more than 5,107 tons of SW was disposed from SRS, of which 2,269 tons were routine municipal-type waste and 2,838 tons were rubble (e.g., construction debris, scrap metal, large pieces of concrete, scrap wood, etc.).

SRS has a recycling program using the City of North Augusta's Material Recovery Facility (MRF). The MRF recovered about 945 tons of the municipal-type waste stream material in 2000, including white office paper, newspaper and magazines, cardboard, plastic, steel cans, aluminum cans and glass. Using the North Augusta MRF resulted in SRS recovering and recycling about 44 percent from this part of the sanitary waste stream.



White paper for recycling at the North Augusta Material Recovery Facility

Construction and demolition rubble and non-recyclable wastes are shipped to the Three Rivers Landfill located on SRS property. Handling and disposal of excess untreated pallets and wood waste was changed in 2000. The waste is now shredded through a tub grinder at the landfill and then piled into long rows where landfill leachate water is sprayed onto the material to help

treat the leachate and to accelerate biological breakdown of the primarily wood waste stream into compost for recycle.

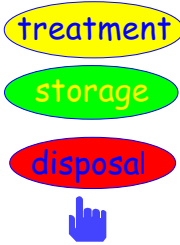
Construction recycled approximately 74 tons of materials such as lead, antifreeze, silver photographic fixative, fluorescent light bulbs, etc. Salvage Operations processed approximately 1345 tons of materials such as scrap metal, toner cartridges, used drums, etc. In total, approximately 1,595 tons (approximately 38 percent of this part of the sanitary waste stream) of industrial materials were recycled through site programs.

During 2000, SWD continued the program to directly dispose of "Green Is Clean" waste into the Three Rivers Regional Landfill. The "Green is Clean" waste program ensures that waste segregated from operations' areas with risk potential are non-hazardous, not radioactively contaminated and meet sanitary waste disposal criteria. In 2000, SWD processed in excess of 7,157 bags of "Green Is Clean" and associated waste directly to the Three Rivers Regional Landfill, thus avoiding management of this waste stream as a higher cost low level radioactive waste.



Three Rivers Landfill at SRS

A project to provide facilities to convert SRS incinerable sanitary waste into a bio-mass fuel form was initiated in late 2000. Pelletizing and other associated waste treatment equipment was obtained from the DOE Idaho site and is being installed at SRS. This project will eliminate land disposal of this entire waste stream with savings in energy and transportation costs. The project is scheduled to become operational in December 2001.



treatment facilities

CONSOLIDATED INCINERATION FACILITY

In Fiscal Year 2000, the Consolidated Incineration Facility (CIF) processed 3,156 gallons of raw PUREX solvent. This production schedule would have exceeded the DOE goal of 5,000 gallons by the end of Fiscal Year 2000; however, DOE decided to suspend operations at CIF in order to provide funding for higher priority site missions. A study to determine an alternative treatment technology for CIF waste streams was initiated during the year. If an alternative cannot be found, it is expected that CIF will resume operations.

An agreement was negotiated with the South Carolina Department of Health and Environmental Control (SCDHEC) on the detailed clean-out requirements to be completed in order to enter into suspension of operations at CIF. This agreement included a detailed Safety Assessment and Clean-out Strategy, and a Surveillance and Maintenance Plan.



The Consolidated Incineration Facility

EFFLUENT TREATMENT FACILITY

The Effluent Treatment Facility (ETF) operated by SWD collects and processes low-level radioactive and chemically contaminated wastewater from both the HLW Tank Farm Evaporator overheads, and from reprocessing facility evaporators. Additional waste streams include wastewater from CIF and well water from Environmental Remediation processes. The ETF process, using micro-filtration, organic removal, ion exchange and reverse osmosis, allows approximately 99 percent of the water collected to be released to the environment through a National Pollution Discharge Elimination System (NPDES) permitted outfall.

Additionally, the facility maintains and operates cooling water basins designed to safely manage reprocessing facility contamination events, and two retention basins that collect storm water runoff from SRS's F and H Areas. The retention basin water is routinely collected, analyzed, and then released. In the event of contamination of one of these basins, the water can be routed through the treatment process.



Aerial photo of the Effluent Treatment Facility

treatment facilities

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Loading activated carbon filters at the Effluent Treatment Facility

ETF had an outstanding year as evident by the following accomplishments:

- Continued to meet site demand for effluent water treatment (i.e., treated and released over 13 million gallons of water in 2000) and met as low as reasonably achievable (ALARA) goals despite a significant (three-fold) increase in tritium concentration from the input streams
- Received and processed 94 tankers of CIF blowdown water
- Received and processed 19,406 gallons of Environmental Restoration purge water
- Received, sampled, analyzed, and released 34 million gallons of stormwater from the retention basins, and 3.6 million gallons of cooling water from the cooling water basins
- Developed a program to ensure I-129 contaminated waste from ETF and F and H Groundwater Units have disposal paths

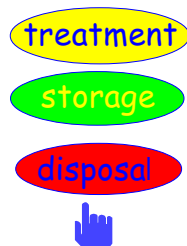
SALTSTONE

The Saltstone Facility is designed to treat and dispose of liquid wastes from various sources. The resulting grout is disposed by pumping it to engineered concrete vaults. After the curing process is complete, the waste form is then classified as low level waste.



Saltstone Facility in Z- Area

The Saltstone Facility has been in suspension since 1999 because of the decision to seek an alternative process to prepare high level waste solutions for the Defense Waste Processing Facility (DWPF) and Saltstone. Suspension of the facility reduces costs while minimizing potential deterioration of the plant. This action helps to support future operations of the plant and minimize the cost to restart the facility in the future.



program accomplishments

PROGRAM ACCOMPLISHMENTS

This section of the SWD Annual Report provides an overview of the significant program accomplishments that were achieved in 2001. At the end of each year, it is extremely reassuring to see firsthand the level of commitment and involvement by the SWD workforce as SWD addresses each and every challenge provided by its DOE customers.

However, once again, this year focused on our vision of being "simply the best" as SWD continued its search for continuous improvement in using its resources wisely, and in the most cost-effective methods of day-to-day activities possible.

As always, safety remains a top priority, and during 2000, SWD took great pride in leading the site in implementing the Behavioral Based Safety approach sitewide as is referenced in the accomplishment below.

BEHAVIOR BASED SAFETY

Statistics indicate that 96 percent of all workplace accidents are behavior-related. SWD, along with the rest of WSRC, agreed to implement a Behavior-Based Safety (BBS) process beginning in 1999. Through the partnering agreement, BNFL plc. arranged the transfer of its proprietary BBS process information to WSRC at no cost, eventually saving the Savannah River Site in excess of \$1.5 million.

WSRC has committed to implement BBS sitewide and since BNFL has extensive experience in this arena, SWD had the lead role at SRS for implementing this safety program.

One of the reasons that BBS has been so effective in industry is because it fully engages the workforce in safety management. Typically, traditional safety programs are top-down driven, with attention provided only when injuries occur. The BBS process encourages "safe behaviors" through routine facilitated safety discussions in the work environment.



*Darren Baynham and Jeff Greenway
begin a BBS safety tour
at the Effluent Treatment Facility*

These are typically peer-to-peer discussions that encourage, through positive reinforcement, safe behaviors. The process also involves the creation of a "Local Safety Improvement" team. This team is comprised of a cross section of the employee population and is typically chaired by a worker level member. This team reviews data collected from field safety discussions and determines the action necessary to resolve safety issues.

During 2000, the Effluent Treatment Facility implemented the BBS process. This action completed the implementation of BBS for the operating organizations within the Solid Waste Division. The Solid Waste Management Facility completed implementation of BBS in 1999.

The employees and management of the Solid Waste Division are committed to eliminating injuries in the work place. The entire division strongly believes that the principles that support BBS, along with a determined effort to implement this process, will help SWD realize this goal.

program accomplishments

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DOE Order 435.1, "Radioactive Waste Management" Implementation Team members, Virgil Sauls, DOE-SR, Leroy Williams, SWD, Win Smith, DOE-SR, Stan Massingill, DOE-SR, and Sonny Goldston, SWD

IMPLEMENTATION OF DOE ORDER 435.1

The U.S. Department of Energy (DOE) issued Order 435.1, "Radioactive Waste Management" on July 9, 1999, for implementation within one year. The new and modified Order includes requirements for managing low-level, mixed, transuranic, and high-level waste. SRS successfully completed implementation of Order 435.1 on July 7, 2000.

The team chartered to implement the Order was led by SWD and consisted of DOE-SR, along with representatives from each division managing radioactive waste.

The challenge was to rethink the way the site manages radioactive waste, while keeping matters simple and practical. To meet this challenge, numerous barriers had to be crossed and difficult compliance problems required innovative solutions.

This practical approach is one reason the site is now one of the first facilities in the DOE complex to be in full compliance with Order requirements. This major accomplishment is recognized across SRS, the DOE complex, and at DOE-HQ.

treatment

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disposal



program accomplishments

E-AREA VADOSE ZONE MONITORING PROGRAM

SRS partnered with the Idaho National Engineering and Environmental Laboratory (INEEL), the DOE Center for Excellence for LLW and MLLW, and the DOE Technology Office to implement the Vadose Zone Monitoring System (VZMS).

This system monitors the three soil parameters (i.e., water content, water potential or tension, and contaminant concentration) that determine how fast and in what concentration contaminants are traveling to the groundwater. Forty instruments were installed in three vertical boreholes and four angled boreholes were drilled underneath the centerline of the trench.

In 2000, program accomplishments for the VZMS included:

- Installation of more than 150 instruments in 19 wells to monitor contaminant migration in the E-Area Vadose Zone
- Installation of wells around the completed Slit Trenches

The E-Area VZMS provides cost effective, high quality performance monitoring and a sensitive early warning of any releases from the disposal trench operation. As expected, the first set of water analyses showed that tritium above background levels was moving through



Installing instruments for vadose zone monitoring at the E-Area Low Level Waste Disposal Facility

the vadose zone beneath the trench area where debris with the highest tritium content has been buried. These first analyses confirmed that the DOE Order 435.1 requirements were being met by verifying that Drinking Water Standards are being met.

SUPERCOMPACTOR

The Supercompactor Facility (SCF) was constructed in 1999. The SCF, located in Cell 11 of the Low-Activity Waste Vaults (LAWV), is a mobile unit used to volume reduce compactible low level waste (LLW). It is designed to compact 55-gallon drums containing LLW into pucks that are subsequently placed into reused B-25 containers for disposal in the LAWV. This process allows more efficient and cost effective use of LAWV disposal space.

In order to make compaction more cost effective, waste generators are now packaging compactible waste in drums versus the B-25 containers. Direct disposal waste is shipped offsite in the B-25 containers.

The SCF had an excellent year as seen in the following list of achievements:

- Record production of 17,034 drums processed through the facility
- Since start-up, 24,071 drums have been processed
- Total volume reduction for the facility for 2000 was 3,275 cubic meters



Supercompactor volume reduces a 55-gallon drum into a puck for more cost effective disposal

program accomplishments

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TECHNOLOGY DEVELOPMENT AND DEPLOYMENT

SWD has always recognized the need for the deployment of innovative technologies to achieve the site's waste disposal goals. Some innovative technologies are needed to enable treatment and disposal of problem wastes. Others are deployed to accelerate the site cleanup goals, provide cost savings, support pollution prevention initiatives, and provide minimization of disposal volumes. Deployment of innovative technologies is an integral part of SWD's mission for accelerated environmental cleanup with short-and long-term risk reduction to the community and the environment. SWD has a proactive program to seek promising innovative technologies. First, the end users identify technology needs. The division then seeks technology support for the DOE complex, the private sector, and the universities. DOE's Transuranic and Mixed Waste Focus Area (TMFA) supports many of SWD's technology needs with funding and technology solutions. Private sector potential solutions are funded for further development and demonstration for specific applications.

The TMFA, SWD, the Savannah River Technology Center (SRTC), and the Idaho National Engineering and Environmental Laboratory (INEEL) are working together to develop a system to remotely repackage drummed, mixed, transuranic wastes for eventual shipment to the Waste Isolation Pilot Plant. The system is known as the Handling and Segregating System for 55-gallon drums (HANDSS-55). HANDSS-55 will be deployed at SRS and operated by the Solid Waste Division.

HANDSS-55 is intended to be a semi-remotely operated, modular, waste sorting and repackaging system that would open 55-gallon drums, sort and

segregate the contents, and repackage the acceptable waste separate from the non-compliant waste. SRTC is responsible for the TRU-Waste Repackaging Module (TWRM) which safely removes the sorted waste from the glovebox environment. The TWRM is based upon the proven and successful "split plug" bagless transfer system used at SRS for the processing of special nuclear materials. The system will permit the removal of radioactive products from the HANDSS-55 glovebox directly into a high-density polyethylene storage container. The process uses a welding and cutting operation to fuse and then separate the waste container from the glovebox environment while maintaining both glovebox and storage container integrity.

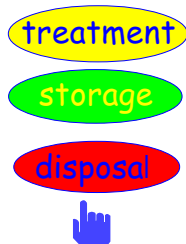
SRTC is currently developing an infrared welding process to seal the TRU-waste container. A working unit was recently demonstrated to produce a full, circumferential weld.



*Infrared
Welding,
a part
of the
HANDSS-55
System*



*System
Overview
of the
HANDSS-55
System*



program accomplishments

PUREX TREATMENT ALTERNATIVES

SWD has established an alternative treatment program for its legacy plutonium/uranium extraction (PUREX) waste that was generated from processing nuclear materials in the F- and H-Canyon facilities. The objective is to identify and demonstrate a treatment technology that is more cost effective than the Consolidated Incineration Facility (CIF).

Typically, PUREX waste is composed primarily of tributyl phosphate (TPB), n-paraffin, and the decomposition products of these two chemical constituents. However, the legacy waste has both an organic and aqueous phase. Water was used in the removal of PUREX waste from the original decommissioned storage tanks. The new waste storage tanks now have a bottom aqueous phase and an upper organic phase. The volume breakdown is about 10,000 gallons of aqueous phase and about 25,000 gallons of organic phase liquid.

SRS has a Site Treatment Plan (STP) commitment to treat 50 percent of the legacy PUREX waste by 2009. The original legacy volume was 42,000 gallons, and prior to the suspension of CIF operations, the facility incinerated approximately 5300 gallons. To meet the



Trucks pull up to loading dikes at the CIF where PUREX was treated by incineration

STP commitment, almost 16,000 gallons of the remaining legacy PUREX waste must be treated before the end of 2009. In addition, the SRS canyons will generate more than 100,000 gallons of PUREX waste over the next ten years that will require treatment. Given the high cost of restarting and operating the CIF to treat PUREX waste, SRS is evaluating potential lower cost options for treatment of this waste stream.

TREATMENT OPTIONS FOR HIGH ACTIVITY PU-238 CONTAMINATED ORGANIC WASTES

Organic wastes contaminated with high activity PU-238 generate high levels of hydrogen gas through radiolysis of the organic material. The high levels of hydrogen gas generation exceed the existing TRUPACT II transportation requirements. The TRUPACT II is the U.S. Department of Transportation approved carrier for transuranic waste. In the event that no satisfactory solution to transportation issues is identified, innovative technologies are needed to treat the high activity organic waste to reduce or eliminate the potential for hydrogen gas generation from radiolysis. SRS is partnering with the TMFA and National Energy Technology Lab to solicit private sector proposals to either destroy or decontaminate organics. Minimum required objectives will be specified to provide prospective vendors maximum latitude in their choice of technology. The primary minimum objectives will include no formation of dioxins and furans, minimal pretreatment, and demonstrated containment of Pu-238.



X-ray of a TRU drum shows clear view of actual contents

program accomplishments

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TRANSURANIC WASTE PROGRAM AND SHIP TO WIPP

The TRU waste program has historically focused on acceptance and maintenance of safe storage. However, with the Waste Isolation Pilot Plant (WIPP) now open and operating, SRS has an aggressive, cost-effective program in place to begin shipments of its TRU waste in 2001. WIPP was opened to accept waste from the DOE complex in 1999. As the New Mexico permit requirements were changing during the year, SRS was already seeking innovative solutions to meet the changing requirements.

SRS passed the Carlsbad Field Office audit and is the only site to have accomplished this task on the initial audit.



A TRUPACT arrives at WIPP, which is located near Carlsbad, New Mexico

In 2000, TRU Waste accomplishments included:

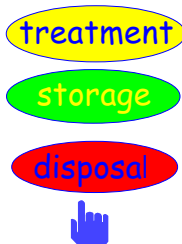
- Completing Vent and Purge operations for 547 containers
- Completing liquid removal of approximately 16,500 gallons from four TRU Black Boxes and 16 mixed TRU Black Boxes, exceeding a goal of 15 boxes
- Successfully constructing and starting the TRU Visual Examination Facility (TVEF). Completed processing of four candidate drums.
- Completing Line Management Assessments on Ship to WIPP characterization and loading processes
- Completing the Readiness Self-Assessment on the TVEF
- Restricted Hot Operations with TRU waste began in August for Ship to WIPP candidate drums
- Safely and successfully completing characterization processing for 30 candidate drums
- Implementing development of a detailed scheduled program to commence Ship to WIPP operations and Carlsbad Area Office audit preparations

SWD satisfied an important DOE challenge by successfully completing initial certification assessment of all TRU waste generators. Certification of TRU waste management programs is a follow-on effort to low-level waste certification.

Upon arrival at WIPP, trucks are inspected and the TRUPACT shipping containers are tested to ensure that no radioactive material exists on the outer surface



Dale Ormond, DOE-SR Waste Operations Division "measures up" to the documentation required for one full shipment to WIPP



program accomplishments

LOW LEVEL WASTE

To support safe operations, a technical baseline was established for the SRS Low Level Waste (LLW) disposal program in conformance with DOE Order 435.1 and associated guidance. This baseline consists of the following elements:

- Performance Assessment (PA) and Special Analyses provide a systematic analysis of potential long-term performance of the E-Area Low Level Waste Facility (LLWF)
- A Composite Analysis (CA) to calculate potential releases from all DOE sources in the General Separations Area for integrated assessment of risk
- The first full-scale deployment of vadose zone monitoring of a LLW disposal facility in the U.S.
- Establishment of Unreviewed Disposal Questions (UDQ) as part of the Safety Analysis process for evaluating proposed actions and discoveries
- Waste Acceptance Criteria (WAC) that proceduralizes inventory limits from the PA and other safety basis documents

In support of the technical baseline, a Disposal Authorization Statement (DAS) was issued by DOE HQ to SRS authorizing continued LLW operations. This system of controls and confidence in SWD's ability to safely manage long-term risk is allowing SRS to move beyond original plans for the limited use of trenches for disposal; therefore, expanding the number and variety of waste streams that can now dispose into trenches.

DISPOSAL OF THE "OLD" SOLVENT TRAILER

One of the more innovative disposal actions was completed in September 2000. This operation included the disposal of a trailer that was used years ago to transfer waste solvent from the Separations Facilities (canyons) to waste storage tanks. The disposal operation involved a crane lift of the trailer, placement into the trench, grouting the base, filling the interior of the tank with cement backfill, and then completing the grouting around the body of the trailer.

The disposal of the solvent waste trailer is a significant milestone for SWD's LLW disposal program. This action opens the door for the safe, cost-effective, and environmentally sound disposal of large equipment as SWD moves forward to properly dispose of legacy waste materials at SRS.

Crane lift of the Old Solvent Trailer into a trench



Components in grout disposal of Old Solvent Trailer in E-Area Low Level Waste Facility



ENGINEERED TRENCH DISPOSAL

The original PA (Performance Assessment) for the E-Area LLWF was issued in 1994. In this PA, the only use of trenches for LLW disposal was for soil that was suspected to be contaminated with radioactive material. Subsequently, the use of trenches was expanded to include rubble and wood products. In 2000, a revision of the PA was approved to include disposal of a wide variety of waste types in trenches. The new PA included Homogeneous Cement-Stabilized Waste (ashcrete) and Cement-Stabilized Encapsulated Waste (components in grout).

program accomplishments

treatment

storage

disposal



UNREVIEWED DISPOSAL QUESTION

Another SWD accomplishment in 2000, was the development of a process to assess proposed or discovered changes in Low Level Waste Facility (LLWF) operations to ensure that the performance envelope (i.e., the PA and CA) was not exceeded. This process is similar to the Unreviewed Safety Question (USQ) process and is called the Unreviewed Disposal Question (UDQ) process. Using this process, the following evaluations of proposed activities were conducted:

- Use of an Engineered Trench versus slit trenches
- Disposal of a wide variety of waste types in trenches
- Disposal of the spent solvent trailer in trenches

OTHER LLW ACCOMPLISHMENTS

Studies were conducted to potentially enhance the trench disposal capacity for Iodine 129-bearing waste and to obtain regulatory endorsement for the disposal of radioactively contaminated large equipment containing lead. A special analysis was conducted to reduce conservatism related to the trench disposal of wood products (i.e., to remove the restriction that wood products could not exceed 40 percent of the waste mass disposed in the active portion of a trench).



16

Effluent Treatment Facility activated carbon columns are used to remove Iodine-129

Other positive initiatives completed in 2000, include the development of closure and monitoring plans for the E-Area LLWF and a Composite Analysis Monitoring Plan. Also, several programs continue to focus on waste minimization, waste volume reduction and segregation, release of clean waste, and disposal of very low activity waste in trenches instead of vaults. Because SRS disposal locations must always meet rigorous Waste Acceptance Criteria (WAC), these programs will demonstrate environmentally sound LLW disposal practices and extend the use of the existing disposal vaults at least 22 years, thereby delaying or possibly eliminating new vault construction.

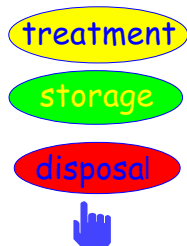
The Volume Reduction Program includes sorting wastes for compaction. Compaction provides more than a three-to-one reduction in waste volume. Operation of the Waste Sort Facility and the supercompactor completes a highly aggressive program to minimize disposal volume and costs of LLW at SRS.



Glove boxes are used to safely sort waste at the Waste Sort Facility

SHIPMENT OF LLW TO NEVADA TEST SITE

The recent Waste Management Programmatic Environmental Impact Statement (WM PEIS) Record of Decision (ROD) for LLW and MLLW will allow shipment of LLW from SRS offsite for disposal. During 2000, activities were initiated to gain certification in 2001 from the Nevada Test Site to ship LLW that is technically or economically justified to that facility for disposal. Shipments are expected to start in the third quarter of 2001.



program accomplishments

LLW SHIPMENTS TO ENVIROCARE

In 2000, SWD was part of a SRS team that successfully assisted the Environmental Restoration Division (ERD) in remediating four Savannah River Laboratory Seepage Basins by removing contaminated soil and shipping it offsite to Envirocare in Utah.



SRL Seepage Basin contaminated soil is placed in protective bags before loading on railcars



A train load of contaminated soil leaves SRS for disposal at Envirocare in Utah

two-year period and focused on improving waste certification program performance in the areas of training, organization and infrastructure, characterization data quality, and control of non-conformances.

To ensure continuous improvement in waste certification program performance, a permanent Waste Surveillance Inspection Program was developed and is planned for implementation in 2001. Surveillance will be performed using SWD and facility Generator Certification Officials (GCO). The reviews will focus primarily on in-process waste stream inspections, which will provide further assurance of compliance to the Treatment, Storage and Disposal (TSD) Waste Acceptance Criteria (WACs) and applicable regulations.

MIXED WASTE

In the Mixed Waste Program, major accomplishments for 2000 include the following:

- Characterizing two major STP waste streams, radioactive contaminated solvents and mixed waste oil. This effort exceeded the original planned campaign by 43 drums.
- Emptying the liquid contents from the Old Solvent Trailer prior to turning it over to the Low Level Waste program for disposal
- Completing building construction and ventilation installations for the future Mixed Waste Processing Upgrades Facility.
- Sampling and analyzing 10 cubic meters of mixed waste in storage in support of the Inventory Control Program of Hazardous Mixed Waste (E-14)
- Sorting and rad screening 20 containers of STP-identified waste stream, i.e., Clemson radioactive polychlorinated biphenyl (PCB) waste

LLW CERTIFICATION IMPROVEMENTS

The Solid Waste Division satisfied another important commitment with the successful completion of targeted program reviews of all SRS low level radioactive waste generators. The evaluations, coordinated by SWD and conducted by SRS Quality Management Council and the Solid Waste Management Council staff, spanned a

program accomplishments

treatment

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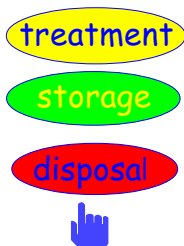
*The
Nevada
Test
Site*

ENVIRONMENTAL MANAGEMENT INTEGRATION

The Solid Waste Division continued to support Environmental Management Integration (EMI) in 2000 by serving as the site lead to the Project Management Team (PMT), which is made up of senior executives from the top ten DOE site contractors from across the complex. This team continued to provide support and guidance to DOE-HQ senior management. The team also provided Subject Matter Experts (SMEs) to serve on numerous task teams in 2000 to develop plans and programs for future activities. Some of the activities supported by the SRS Solid Waste Division include:

- The Mixed Low Level Waste/Low Level Waste (MLLW/LLW) team spearheaded the implementation strategy for DOE Order 435.1 "Waste Management". A national workshop was held that allowed each site to share its successes and solutions to very difficult implementation problems. SRS personnel from SWD played a key role in the interpretations and implementation of the Order. Many of the SRS strategies were adopted on a national scale.
- In 2000, the Waste Management Programmatic Environmental Impact Statement (WM PEIS) Records of Decision (RODs) were issued for the treatment and disposal of MLLW and LLW. Each

- site then had the task to plan shipments of its "Orphan Wastes" to selected treatment and disposal sites around the country. Through EMI workshops and contacts, shipments of SRS wastes to facilities such as the Nevada Test Site are currently in the process of being approved and are expected to begin next year. The EMI program and especially the MLLW/LLW team played a major role in laying out the strategy for implementation of the activities not only for SRS, but also for the rest of the complex.
- An EMI Incinerator Workshop was held in August 2000 to identify the demand for incineration capability within the DOE complex based on current projected waste types and volumes. In conjunction with the TRU and Mixed Waste Focus Area (AMFA), alternative treatment options for waste where incineration is acceptable were identified. Wastes, such as the PUREX waste at SRS, which currently have no alternative treatment option, were discussed and plans were formulated for future technology development.
- A 1997 EMI Initiative to "Consolidate Small Quantity Site Waste at Larger Sites" came one step closer to reality this year with a series of meetings and discussions concerning the transfer of Mound TRU waste to SRS. SRS personnel supported several



program accomplishments

strategy meetings to determine the correct path forward for dealing with this waste to meet the closure schedule for the Mound facility. A Value Engineering study was conducted in August 2000 to look at and cost out alternatives for transfer of the Mound Waste to SRS. This study concluded that shipping the Mound TRU to SRS was the most cost-effective, and schedule-friendly approach. Many obstacles have had to be overcome including state equity, transportation, and characterization issues. Through the dedicated efforts of both SRS and Mound personnel, it is expected that this transfer will happen, starting in 2001.

The *System Plan* considers all aspects of waste handling including treatment, storage, and disposal. The plan has two primary functions. The first is to conduct a detailed options analysis and lifecycle cost evaluation for the disposition of each of the waste streams identified, and to make recommendations for the preferred waste disposition. The second function is to provide the primary planning and outyear scope for the Solid Waste Baseline, which supports DOE's upper level plans, as outlined in the Integrated Planning, Accountability, and Budgeting System.

These components provide the mechanism to effectively manage SRS waste streams to eventual end state.

SYSTEM PLAN

The *Solid Waste Division System Plan* for managing treatment, storage, and disposition of waste streams was revised and updated in 2000. This revision enhanced the *System Plan* format and incorporated additional options and "Lessons Learned" from the previous year.



Peter Hudson, Jay Rumsey, Bernie Mayancsik, Gerald Taylor, and Brent Daugherty review the Solid Waste Division System Plan

POLLUTION PREVENTION

SRS continues to make significant progress toward reducing the generation of waste and pollution. During 2000, waste generators implemented over 70 projects resulting in an avoidance of approximately 416,000 cubic feet of radioactive and hazardous solid waste. The estimated annualized savings from these projects are \$21.9 million, with projected lifecycle savings of \$72 million. Waste receipts of radioactive and hazardous solid waste (LLW, HW, MLLW, and TRU) from routine operations in 2000 represented a ten percent reduction from 1999 and the lowest volume since inception of the P2 Program.



Greg Rudy, DOE-SR signs a Pollution Prevention Week Proclamation

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POLLUTION PREVENTION (CONTINUED)

Some examples of significant P2 projects for 2000 include the following:

- Establishing the SRS Containment Fabrication Facility (CFF) to manufacture custom-designed high quality radiological and hazardous material contamination containment devices for use in complex system invasive work
- Two pilot projects to segregate clean, nonradioactive waste from low-level radioactive waste
- Implementing the HB-Line Clean Waste Diversion Pilot that surveys and releases fresh air hoods at a rate of 3,000 cubic feet per year to the sanitary waste "Green is Clean" Program
- Establishing a program at the HLW tank farm to clear materials for unconditional release
- Engineering and commercially licensing a portable containment and protection sleever that manually dispenses a plastic sheath, or sleeve, over long and comparatively narrow objects in less than a tenth of the previous time
- Changing methodology for handling and disposing of excess untreated pallets and wood waste
- Continuing Contamination Area (CA) Rollbacks to drive down LLW generation while reducing employee hazard exposure and increasing productivity

The SuperSleever dispenses a plastic sheath over long and narrow objects in less than a tenth of time



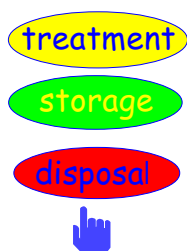
Kathy Klapper, Becky Boykin, and Ed Korzun work in the contaminated area rollback at the Savannah River Technology Center

Because the Pollution Prevention (P2) and Waste Minimization Program is inherent in all facets of activities at Savannah River Site, it is only natural that this initiative is extended to many of the public outreach activities as well.

In 2000, P2 Program personnel planned and participated in activities such as Earth Day, Pollution Prevention Week, and American Recycles Day. These events allowed both local community and on-site organizations to share information on pollution prevention initiatives and also offered opportunities for additional public involvement.



Students at Belair Elementary School in Martinez, GA participate in a P2 discussion about reusable containers



public involvement & communications

PUBLIC INVOLVEMENT

During 2000, the Department of Energy (DOE) Savannah River Operations (SR) and SWD continued a comprehensive public participation and communication program. This program provides the public with accurate, complete, and timely information and early meaningful participation opportunities. A major goal of the program is to fulfill the objectives of the SWD and SRS strategic plans to “build trust and communicate openly, honestly and responsibly with employees, customers, stakeholders and regulators” and to “work to extend the support of external stakeholders for the pursuit of SRS and complex business goals”.

Witnessing firsthand that stakeholder involvement is essential to finding, developing and ultimately deploying innovative program solutions related to the environmental cleanup of SRS, SWD worked in concert with the SRS Citizens Advisory Board (CAB), its Waste Management Committee (WMC) and DOE. During 2000, SWD supported a record number of 17 CAB recommendations and received two commendations.



Sonny Goldston (left) and Jim Blankenhorn (right) show the TRUPACT-II to Wade Waters (center), a member of the CAB, and Chair of the Waste Management Committee

Of major importance for the year was the Ship to WIPP project that SWD manages for DOE. In Fiscal Year 2000, the CAB provided DOE with four recommendations on this program alone. The CAB recognized that the Savannah River Site (SRS) has about 11,000 cubic meters of transuranic (TRU) waste stored in drums, steel boxes, and concrete casks that it expects to ultimately ship to New Mexico for disposal. The WIPP permit conditions continued to change and the CAB requested that the state of New Mexico stabilize the permit requirements so that shipments could begin as soon as possible.

The CAB also continued to emphasize that DOE develop methods to ship high activity TRU waste to WIPP. Noting that DOE has not made as much progress in this area as the CAB would like to see, the group made recommendations to DOE that reflected the CAB's continuing interest in this area.

For example, the CAB recognized that for some time, DOE had a program to improve the shipping package and to revise the criteria to ship the high activity TRU waste to WIPP. Although work proceeded on enhancing the transport system, its slow progress impacted the schedule to submit Safety Analysis Report (SAR) revisions to the Nuclear Regulatory Commission (NRC). Because revisions must be aligned with whatever new shipping criteria result, the CAB submitted a recommendation acknowledging that any late decision could have required SRS to construct a new facility to treat its high-activity TRU waste, requiring additional taxpayer dollars.

In briefings held throughout out year, the CAB heard how SRS pursued parallel objectives as it prepared to make its first shipment to WIPP. The first objective was to complete all preparatory work and commence the Ship-to-WIPP campaign. Westinghouse Savannah River Company (WSRC) remained on schedule to begin “hot” operations for TRU waste characterization in

public involvement & communications

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SRS CAB's Waste Management Committee meets on a regular schedule because of the high volume of SWD and HLW issues requiring stakeholder participation

September, and also explored ways to accelerate the Ship to WIPP schedule so SRS could make its first TRU shipment in 2001.

Briefings were provided to the CAB on an Environmental Management Integration (EMI) initiative to ship a relatively small inventory of TRU waste from the DOE Mound Facility in Ohio to SRS.

Recognizing considerable taxpayer savings by closing the Mound site, and the relatively low risk and use of external funding to ship Mound waste to SRS, the CAB submitted a recommendation endorsing DOE's proposal to ship the Mound waste to SRS.

In addition to the TRU Waste Program, the Low Level Waste (LLW) Program was also a major player in CAB issues for 2000. In fact, work on the TRU Program was just "the tip of the iceberg" for the CAB and SWD. Early in January, SWD received a commendation from the CAB for its effort on the SRS, DOE-HQ approved low-level waste (LLW) Disposal Authorization Statement (DAS). In the commendation, the CAB said that it believes the DAS signifies excellent operational

performance in the management of low-level wastes at the E-Area Vaults and Slit Trenches and also believes that all SRS low level waste can be managed safely and more cost effectively than shipping waste to sites across the United States.

The second commendation for the year referenced SWD's use of the E-Area Trenches versus the E-Area Vaults for LLW disposal. The CAB commended SRS (through SWD) for using scientific and technical criteria and systems engineering approaches to extend the life expectancy of the existing E-Area vault. In addition, the CAB recognized the significant cost savings that would be realized while at the same time the approaches would ensure protection of human health and the environment.



Heather Holmes-Burns presents Vadose Zone Monitoring innovative technology to the SRS CAB's Waste Management Committee

Perhaps some of the most comprehensive recommendations the CAB made during the year came after the announcement that DOE was suspending operations at CIF. Initially, the CAB recommended that DOE reverse its decision and requested DOE to re-institute funding to continue operations at CIF until it could fully justify the decision and until such time that an alternative treatment option would be available, cost effective and could be implemented.

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public involvement & communications

However, the Waste Management Committee held a public workshop to address the suspension of CIF operations and as a result, suggested the formation of a Focus Group chartered to track work on alternative treatments and technologies for PUREX, non-PUREX, and other potential waste streams identified for incineration throughout the DOE complex.

Undoubtedly, over the last five years, Solid Waste Public Involvement has grown significantly because of the CAB's recognition and focus on Waste Management issues. As SWD enters the new millenium, the Division will face many new challenges as it meets program needs. The CAB will be one of the major focus areas when it comes to stakeholder participation.



SWD supports public focus groups chartered to follow and advise CAB committees on complex issues such as the suspension of operations at the Consolidated Incineration Facility

COMMUNICATIONS

In Fiscal Year 2000, communications remained at the top of SWD's list of important functions. The objective of employee communications is to inform employees and retirees alike about what's really going on -- and feature vital information that affects the way employees view SRS.

For instance, media events are developed and implemented for major division accomplishments such as the TRU "Ship to WIPP" program. Local, and sometimes national media groups, are invited to visit SRS to film, interview and report on SRS events.

Other public outreach efforts include site and SWD tours, which are provided to the public upon request. SWD employees also donate their time to supporting functions such as Technology Day, Engineer's Week, and the Boy Scout and Girl Scout Camporees that are held annually at SRS.



*Susan
(Still)
Kilrain,
NASA
Shuttle
Pilot with
two
school
students
at
Technology
Day,
a program
led by
SWD*

Another example of excellent media relations is the *SRS News*. The *SRS News* tells news through stories. Often, these stories are told through the employees. *SRS News* makes them the heroes...for instance, the Pollution Prevention Hero stories.

The *SRS News* provides an ideal way to ensure recognition, boost morale, improve employee relations and educate employees, so they work together toward common company goals.

The Solid Waste Division stories, as they appeared in the *SRS News* during 2000, are found in the following pages.



MAY 2000

Teamwork is the key in basin remediation

Remediation of the SRL Seepage Basins was a perfect example of teamwork at its best. The project team was responsible for the largest shipment of waste material from SRS for disposal at an offsite approved licensed disposal facility. The task, critical to Environmental Restoration (ER), required an ambitious schedule to remediate the basins and remove waste material from a waste unit adjacent to a roadway accessible to the public.

The waste material consisted of radiologically contaminated soil. The remediation called for the removal of all Principal Threat Source Material (PTSM) from the basins and from a 340-foot section of the process sewer line, resulting in one of the largest waste material shipments ever to leave SRS. The effort required the project team to select a disposal facility, determine how to package and ship the material, comply with the disposal facility's acceptance criteria, comply with many different state and federal regulations and develop plans and procedures to successfully complete the task. The SRL Seepage Basins consisted of four unlined basins that received low-level radioactive wastewater from 1954 until 1982 from laboratories in Savannah River Technology Center. The wastewater was discharged into Basin 1 and flow cascaded from one basin to another. Confirmation sampling was performed to validate that all PTSM was removed. The material was packaged in lift liners, which are 9.5 cubic yard double-lined sacks with a 24,000 lb. weight capacity.

The lift liners were first used at SRS as part of the vegetation removal at the basins a year earlier. Utilization of the lift liners for this project saved in excess of \$1.7 million over the traditional method of packaging in B-12 boxes.

Rail was selected as the most cost-effective mode of transportation for the 3,200 cubic meters of soil to be shipped to the disposal facility, Envirocare of Utah. With the waste materials packaged and ready for transport, the team's focus shifted to disposal contracts, transportation contracts, and compliance with DOE Order 435.1, as well as all state and federal regulations. Team members worked diligently to strategize this step of the task. An existing contract already in place with Envirocare was utilized; however, logistics for utilization of the contract were not easy. Paperwork was difficult, and the waste material had to be accepted at Envirocare before SRS could ship the waste. Approval of an exemption to ship the material offsite, as outlined in US DOE Order 435.1, Radioactive Waste Management, was required from US DOE-HQ. Several DOE team members were instrumental in obtaining approval for this exemption.

Another hurdle that had to be negotiated was that South Carolina is considered a quarantine state due to fire ants and beetles. Shipment of the soils to Utah required approval from the Utah Department of Agriculture. With the help of Environment Safety Health and Quality Assurance (ESH&QA), this and other necessary approvals to ship the material was obtained.

Preparation of all the waste acceptance forms and compliance with all of Envirocare's waste acceptance criteria proved to be a challenge. Zhagrus Environmental, Inc., was subcontracted to assist with this effort and provide transportation to Envirocare. To put the extensive transportation effort in perspective, the project's baseline was estimated at 100 gondola rail cars with seven lift liners per gondola car. After the project team received all necessary approvals, the final approval to ship was granted.

Efforts are now concentrated on field remediation. Since the project was a first, there were many different obstacles to overcome during the remediation. With the assistance of Project Engineering and Construction Division (PE&CD) site construction forces, the ambitious schedule for completing shipments to Envirocare in FY00 was achieved.

(story continued on next page)

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srs news

Construction worked many hours and had to perform work-arounds due to inclement weather to accomplish the task. Currently, 600 of 700 lift liners have been filled, 33 rail cars have been loaded, and 26 rail cars have been shipped to Utah.

The project team was comprised of various employees from the Environmental Restoration Division, PE&CD, Solid Waste Division, ESH&QA, Procurement, the Transportation Department, DOE, the Environmental Protection Agency and South Carolina Department of Health and Environmental Control. With the continuing timely support of DOE and the regulators, the SRL Seepage Basin project will be completed by December 2000, months ahead of schedule of the regulatory remediation start date of February 2001.

MAY 2000

Pollution prevention hero for first quarter is Owens

Phil Owens, first-line RCO supervisor at H Tank farm, has earned Pollution Prevention Hero status because he realized that during decontamination work the more you use the more you lose.



Phil Owens

Due to Owens' excellence in radiological CONOPS, radiological controls were tightly maintained during the Replacement High Level Waste Evaporator hot tie-in on Tanks 29, 30 and 32. These tanks are posted as contamination areas and work here has historically generated a large amount of low-level waste. Owens made sure that only materials essential to complete the work were taken into the area. The materials taken in were pretreated and protected to facilitate the ease of removal and cost-effective disposal of waste at the completion of the job.

Owens stressed the implementation of decontamination and housekeeping during the work evolution. Properly implemented, these two actions can reduce waste significantly. Sufficient time must be planned and scheduled in order for job evolution to occur.

"Even though decontamination and housekeeping can produce some incremental waste, the bigger picture is that the total amount of waste and toxicity level of the waste is less at the completion of the job," Owens said. "Scheduling time into each and every day's activities for these functions is essential in ensuring that waste prevention occurs."

MAY 2000

SRS completes TRU waste project ahead of schedule

Recently the Savannah River Site safely completed its project to vent the site's inventory of 11,260 transuranic (TRU) waste storage containers, two years ahead of schedule. The containers were primarily 55-gallon drums, containing trace amounts of plutonium contaminated waste.

These containers will be sent to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, NM, for permanent disposal. WIPP is designed to receive and permanently dispose of TRU waste generated by defense-related activities. The site's TRU waste consists of protective clothing, rags and tools used during the processing of plutonium and other nuclear materials.

(story continued on next page)



(story continued from previous page)

The project also included the safe retrieval of 8,800 buried TRU drums. These drums were stored in the late 1970s and early 1980s on storage pads and covered with dirt for protection from the environment. WSRC began the retrieval project in 1997 and completed it in 1999, also two years ahead of schedule.

“WSRC worked hard to accomplish the retrieval process two years ahead of schedule and at significantly lower costs than forecasted,” said Tom Heenan, DOE-SR assistant manager for Environmental Programs.

The vent and purge process removes hydrogen and other potentially explosive gases that may have built up in the drums during storage. A subcontractor, NFT Inc., built a drum venting system that provided sparkless puncturing of the drum lid. The machine sampled and analyzed the drum’s headspace gases. If an explosive concentration were detected, the machine purged the drum with nitrogen to eliminate the hazard. A filter vent was installed in the drum to allow for venting to prevent the future buildup of gases.

“The successful and early completion of this vent and purge project was a major step forward as we get closer to the eventual shipment of this TRU waste to WIPP for permanent disposal,” said Dr. Sam Kelly, vice president and general manager of the Solid Waste Division responsible for WIPP preparations.

JUNE 2000

Pollution Prevention Heroes Named

Breaking with tradition seems to be something that most people shy away from. Pollution Prevention Heroes Johnny Lott and Jeff Carson are definitely exceptions to this rule.

In the past, fresh air hoods used in the HB-Line facility were disposed of as low-level waste. Lott and Carson developed a pilot program to challenge this status quo. Realizing that their new system would be a significant

culture change, Lott and Carson continually communicated with facility personnel to ensure that all team members (operations, maintenance, radiological control and engineering) were aware of the proposed changes and made adjustments to the system as necessary.

Their pilot included procedure reviews, a thorough review of the past waste disposal system and training development for the new system. After four months of operation, the facility was able to dispose of over 900 fresh air hoods at a lower cost. By using waste minimization practices to decrease the amount of low-level waste generated, they projected that the facility could save approximately \$176,000.

Lott is a Radiological Control First Line Supervisor and Carson is an Alternate Generator Certification Official. Both support the HB-Line facility.

JUNE 2000

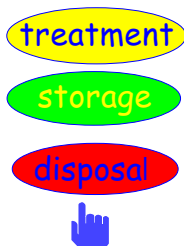
SWD Nightwalkers Wage War on Cancer

Solid Waste Division’s MASH unit established camp at the American Cancer Society’s Relay for Life at North Augusta High School on May 19-20. The BNFL team raised over \$6,000 for the annual event in which team members take turns walking during the 12-hour event.

Relay For life is a community-based event designed to celebrate survivorship and raise money for the American cancer Society. On the night and day of the event, teams of people gathered at the North Augusta High stadium and took turns walking, jogging or running laps. Each team keeps at least one representative on the track at all times.



**SWD
MASH
Unit
Night-
walkers**



JULY 2000

SRS Pollution Prevention Team: Closing The Circle

Environmental stewardship has always been an integral part of the business at SRS. The SRS Pollution Prevention (P2) team has consistently been a major contributor to the site's environmental goals, and their achievements have not been overlooked.

At a recent awards ceremony held in Washington, D.C., Dr. Karen Hooker, DOE-SR Program Management and Coordination Division Director received SRS's third White House "Closing The Circle" award. The Closing the Circle program was developed to "recognize federal employees and their facilities for efforts which resulted in significant contributions to, or significant impact on the environment in specific categories under Executive Orders 13101 and 12856."

SRS, recognized as "one of the best and most consistent achieving programs in the DOE complex," has completed 508 P2/Waste Minimization projects, saving approximately \$137 million. Dr. Sam Kelly, vice president and general manager, Solid Waste Division, attributes the P2/Waste minimization success to teamwork. "The level of support that the P2 Program has received from site divisions is second to none. The team of talented employees across the site who develop cost-effective and efficient methods of incorporating P2/Waste Minimization into their daily operations have gone above and beyond expectations to enable us to maintain a world-class P2 program."

Dr. Hooker was the recipient of the Executive Order 12856 award, which recognizes individuals that have demonstrated outstanding leadership in implementing the pollution prevention provisions of Executive Order 12856. Dr. Hooker is the first to receive this prestigious award.

AUGUST 2000

Brown is pollution prevention hero for third quarter

Roger Brown, a HLW operator, invented a portable device that manually dispenses a plastic protective sheath, or "sleeve," over long and comparatively narrow objects in less than a tenth of the time it takes to do the same work without the device.

For example, a 200-foot flush water hose can be sleeved in less than two minutes versus the usual 45 minutes. When used properly, this "sleeve" contains potential leaks from the object or protects the object from potentially contaminated external elements. The applications for such a device are many and the cost savings are substantial.

SRS uses over 1.7 million feet of air hose per year in various operations around the site. Most applications are one-time and the hoses are disposed of as low level waste.



Roger Brown

Reusing these hoses would save more than \$1 million per year (assuming 100 percent retrieval) for the hoses. There would be an additional waste management cost savings of over \$ 3 million and a waste reduction of 1,700 cubic feet for the site.

Deployment of this device started in January 2000. When fully implemented, it should avoid creating 17,000 cubic feet of low level waste. Additional applications are being developed during field deployment.

Arthur Desrosiers, vice-president of Bartlett Services, visited SRS recently to see demonstrations of the portable containment and protection sleever. His company has licensed the device and plans to produce it commercially under the name SuperSleever.



SEPTEMBER 2000

September Teamwork leads to Pollution Prevention achievement

Each of the site's operating divisions played a vital role in reaching and exceeding objectives in the reduction of operational costs through waste reduction initiatives. So far in fiscal 2000, pollution prevention efforts have produced life cycle cost savings of \$58 million for the site.

DOE, in conjunction with the WSRC and its partners, establishes SRS' pollution prevention goals and program objectives through the Solid Waste Management Council. The Solid Waste Division's Pollution Prevention (P2) staff provides overall program leadership, coordination and guidance in the development and implementation of pollution prevention systems. A Waste Minimization Subcommittee comprised of representatives from across the site, assists with development and implementation of waste minimization strategies and dissemination of information.

The initiative's 59 pollution prevention projects included clean diversion (diverting suspect radioactive materials to reuse or lower waste cost types), the rollback of contaminated areas, the more effective use of personal protective equipment and process/technology initiatives aimed at pollution prevention.

The SRS P2 Program promotes source reduction and recycling practices that reduce the use of hazardous materials, energy, water and other resources while protecting resources through conservation or more efficient use. Pollutant reduction is first accomplished by eliminating or minimizing the generation of pollutants at the source. All materials used on site are recycled/reused when practical. The remaining wastes are managed to comply with federal and state environmental regulations to reduce volume, toxicity and/or mobility before storage or disposal.

"Our program continues to be the best in the complex and we intend to maintain this by continually setting ourselves even higher goals," said Tim Coffield, Solid Waste Division Waste Minimization manager. "In this respect, next year's target of \$15 million in annualized savings is ambitious and we are looking forward to the challenge."

You can help meet this new objective by identifying opportunities to reduce operating cost through pollution reduction initiatives at your job. P2 recommendations can be submitted through the IDEAS Program or by notifying your Waste Minimization Committee representative.

OCTOBER 2000

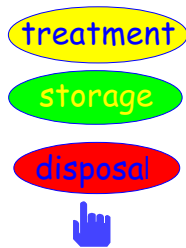
Disposing of spent solvent trailers

Thanks in large measure to reviews and input from the Citizens Advisory Board, SRS's Solid Waste Division has begun disposal of low-level radioactive wastes in trenches rather than more expensive vaults. If the waste is only slightly contaminated or can be otherwise treated to meet trench Waste Acceptance Criteria (including not exceeding drinking water standards in the groundwater at compliance wells), then the CAB recommended that the trenches be used for disposal. This recommendation would result in significant cost savings to the taxpayer.

One of the more innovative disposal actions was completed in September 2000: disposal of a trailer that was used years ago to transfer waste solvent from the Separations Facilities (canyons) to waste storage tanks. This "spent solvent trailer" was empty of the radioactive solvent, but continued to have residual contamination on its interior surfaces. The trailer was characterized to ensure that radioactive contamination was below the Waste Acceptance Criteria for disposal in a trench as a "component-in-grout," and the plan for the disposal operation was evaluated to ensure it met all safety and environmental standards.

One of the more significant evaluations was a technical analysis to ensure that the trailer's disposal was well within the boundary established by the Performance Assessment (PA). The PA is the long-term analysis that demonstrates that this type of disposal will meet DOE's performance objectives. The technical analysis is known as an Unreviewed Disposal Question evaluation. It showed that the trailer meets the PA requirements when filled and surrounded with cementitious backfill, and surrounded by grout with a compressive strength of 2,000 psi.

The actual disposal operation involved a crane lift of the trailer, placement into the trench, grouting the base, grouting around the body of the trailer, filling the interior of the tank with cementitious backfill, and then completing the grouting around the top of the trailer. This is a significant milestone for SRS's low-level waste disposal program and opens the door for the safe, cost effective and environmentally sound disposal of large equipment as SRS moves forward to properly dispose of legacy waste materials.



OCTOBER 2000

Pollution Prevention Week celebrated

National Pollution Prevention week recently kicked off at the New Ellenton Middle School. National Pollution Prevention Week is a time when businesses, environmental groups and citizens join forces for a common cause. By sharing information about pollution prevention (P2), both businesses and government can realize cost savings and environmental quality can be enhanced.

Speakers from the Savannah River Site Pollution Prevention Team of Sarita Berry, Penelope Fulghum and Caroline Grosso lead discussions and hands on activities about source reduction, reducing, recycling and reusing consumer products took place with all sixth, seventh and eighth grade science students. The discussions included ways in which students can avoid creating pollution. Students also learned ways they can conserve water, save energy and use non-toxic cleaning products.

Students were given science experiments kits, which they could conduct at home. One of the kits tested for toilet leaks by using a package of Kool-Aid drink mix. Discussions also encouraged the use of the Aiken County recycling program and the usage of nontoxic substitutes for common household cleaning.

If you are interested in a representative from the SRS P2 Pollution Prevention team speaking for your school or civic organization please contact Sarita Berry, 557-8124, or Caroline Grosso, 557-6351

NOVEMBER 2000

America Recycles Day to be celebrated at SRS

SRS will celebrate America Recycles Day 2000 on November 15. Recycling education events will take place in the breezeway and parking lot of the A-Area cafeteria from 10 a.m. until 1 p.m.

Exhibitors from both on- and off-site organizations will provide employees with information on recycling and buying recycled products. The theme of this year's event

is "For Our Children's Future...Buy Recycled Today." Exhibits will include:

SC Energy Office
Affirmative Procurement
(Purchase of Recycled products on site)
SC Department of Health and Environmental
Control
Excess Operations at SRS
SRS Chemical Commodity Center
Santee Cooper Project (reuse of oil and antifreeze)
NiCad battery recycling
Recycling at SRS

During the event, attendees may enter the national drawing for the Green Dream House. The America Recycles day organization will construct a home of primarily recycled products and materials for the winner. The Green Dream House is an illustration of the vast array of recycled products available to consumers.

In its three years, America Recycles Day has generated renewed public enthusiasm for recycling, and has helped to introduce the importance of buying recycled content products. Last year, more than 2.9 million Americans participated in events around the country in 49 states, the District of Columbia, Puerto Rico, and the US Virgin Islands.

NOVEMBER 2000

Fourth Quarter Pollution Prevention Hero is Ellen Parrish

Ellen Parrish is primarily responsible for the Contamination Area Rollback success story in SRTC. Ellen led the effort for successful decontamination and rollback of the 773-A E-Wing fan rooms, as well as room F-003. Prior to the rollbacks, she performed numerous walkdowns and housekeeping activities. Ellen then coordinated and assisted with the decontamination activities, removal

(story continued on next page)



Ellen Parrish

of legacy material and equipment, as well as relocating a radioactive source.

One of the major benefits of the rollbacks is the reduction of low-level radioactive waste that is generated from these Contamination Areas. Another benefit is that personnel are no longer required to wear two sets of protective clothing or respiratory protection to enter these newly rolled backed areas.

The total rollback effort of the E-Wing fan rooms and F-003 was 3,441 square feet. This will prevent the generation of approximately 100 cubic feet of low-level waste annually. In addition, laundering over 1,400 pounds of protective clothing annually will be avoided. The total annual savings are estimated to be over \$21,500.

Parrish continues with her excellent efforts and has most recently completed rollback of the F-090 corridor. Her current Contamination Area Rollback is taking place in F-091.

Parrish is a Senior Operations Specialist with the Technical Area Operations group.

DECEMBER 2000

SRS celebrates America Recycles Day

The average American generates nearly 1,500 pounds of trash each year, creating more than 200 million tons of waste annually in the United States.

While these figures are daunting, there are measures each consumer can take to reduce these numbers. Each year more Americans are recycling. The nation's recycling rate is now more than 28 percent. This means the steel and aluminum cans, glass jars, paper, plastic and even rechargeable batteries we place at the curb or at drop-off facilities are making a real difference in reducing our nation's waste.

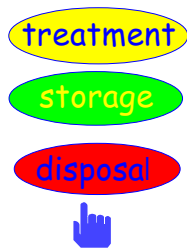
On November 15, SRS, along with thousands of Americans across the country, took part in "buy recycled" activities as part of America Recycles Day. Exhibitors from both on- and off-site organizations provided employees with information on recycling and buying recycled products.

The South Carolina Energy Office and E2, the energy guy, talked with employees about how we can save energy at work and at home. Santee Cooper personnel and Tim McCormick of WSRC's Central Service Works Engineering discussed a new program that involves recycling NiCad batteries, motor oil and antifreeze. The Solid Waste Division highlighted Recycling, Reducing and Reusing at SRS in a pictorial backboard display and held open discussions with employees about recycling and reuse on site. The IDEAS group accepted energy saving ideas from employees and gave out coffee mugs to those who submitted new ideas. U. S. Forest Service's bags and bags of roadside rubbish dramatically displayed the trashing of our site roadways.

The theme for this year's America Recycles Day was "For the Future... Buy Recycled Today." It underscored the importance of purchasing recycled content products and packaging, and the contributions that recycling makes on the environmental well-being of future generations. Thousands of recycled content products are available and, by purchasing them, the nation's consumers are building markets for finished products made from the items they place in those recycle bins.

*Celebrating
America
Recycles Day
with E2,
the energy guy,
at the
Savannah
River
Site
(photo
recycle1)*





trends 2001

TRENDS 2001

As we move into the millennium, the primary vision for the Solid Waste Division (SWD) will be our safety and performance excellence such that we continue to be recognized as "simply the best" as providers of waste management services across the DOE complex. Underlying the many achievements of Fiscal Year 2000 is an infrastructure based on disciplined operations and safety. This culture will continue to be the backbone of our successes in 2001.

Specific 2001 goals can be grouped under the broad categories of safety, technical performance, and people. Our safety objective is simple – to establish an environment where a "zero injuries" philosophy becomes a reality. Integral to this culture is a behavioral-based approach to safety, which has been fully implemented within SWD, and with our Division's leadership, across the Site. The Division's two Local Safety Improvement Teams will continue to play an important role in ensuring personnel consider "at risk" behaviors for any job they are assigned, thus promoting safe behaviors and proactively reducing the probability of accidents and injuries in the workplace.

All personnel will contribute to the aggressive technical performance goals that have been established for 2001. By far, the two most challenging areas will be implementing the Ship-to-WIPP program and assuming the emergent scope of work associated with the receipt of Mound waste. Success for Ship-to-WIPP can be measured by the successful completion of the Carlsbad Field Office audit; being the first site to do on the initial audit; and then obtaining certification and making the initial shipment to the Waste Isolation Pilot Plant (WIPP) early in 2001. The Mound project will showcase the technical, operational, and managerial strengths of our Division. An accelerated schedule, both for waste characterization and shipments to WIPP, will require both operational and strategic planning expertise to be successful. Concurrently, this project will provide opportunities for SWD to demonstrate its leadership

within the DOE complex by partnering with two other DOE sites. As a result of our planned receipt of shipments of Pu-238 TRU waste from Mound, SWD will play a key role in contributing to a significant cost savings within the complex by supporting an early Mound Site closure. Other key Division activities include continued achievement of challenging goals established for reduction in our low-level, hazardous, and mixed legacy waste inventories and timely construction and startup of a mixed waste processing facility and an engineered trench. The Effluent Treatment Facility will carry on with its critical mission by continuing to meet site demand for effluent water treatment.

Finally, a primary focus for 2001 will be our people. With the suspension of the Consolidated Incineration Facility at the end of Fiscal Year 2000, approximately one-third of the SWD workforce has assumed new positions within the Division. This will create opportunities to use the talent of our personnel in other high priority areas. Comprehensive training programs will be implemented to ensure that our personnel possess the skills and knowledge required to successfully perform in their new assignments.

All strategic and Annual Operating Plan goals for Fiscal Year 2001 will be accomplished despite budget challenges, including a significant unfunded scope of work. These challenges will be met through aggressive project management; initiation of innovative work practices; and the fostering of teamwork and partnerships to maximize effectiveness and minimize costs.

In summary, our safety record, excellent technical performance, and our talented, flexible workforce have postured SWD to be successful in both planned and emergent missions that are expected next year as well as in the future.

pollution prevention public outreach

treatment

storage

disposal



During the year, as part of SWD's commitment to pollution prevention public outreach programs, personnel traveled to local schools to share and teach pollution prevention awareness to public school classrooms in many of the counties that surround the Savannah River Site. In 2000, SWD personnel reached over 2,100 students during over 80 school visits. During these visits, students participated in hands on experiments and were encouraged to openly discuss pollution prevention ideas for both their schools and homes.


Here, we would like to share some of the correspondence our personnel received from students and teachers alike. It's reassuring to know that children, even at the elementary school level, are keenly interested and are becoming involved in the world of pollution prevention. We, the Solid Waste Division, are pleased to be a part of these young lives. We know you will enjoy reading these thank-you notes!

Dear Ms. Berry, I think that you are very nice for sharing with us. I was thoughtful of you. My favorite part was you showing us that pollution is not good. I will try not to because pollution. I am so glad you came to talk to us about pollution. I have already started preventing pollution. Now I feel so much better. Thank you for bringing a pollution solution into my life.

Love,
Aaliyah

*Thank-you notes from:
second graders,
Aaliyah,
Allie,
Sonyte,
and Victoria, and
their teachers
Mrs. Cruse,
and
Mrs. Henderson*

Dear Ms. Berry,
I had fun taking about recycling and waste.
You are the best visitor I ever had before.
You are nice. Thank you for the pins.
PS. I had a good time.
Your Friend,
Sonyte



October 6, 2000
Mr. Tim Collier
Manager, Solid Waste Pollution Prevention
Savannah River Site
100-02
Aiken, South Carolina 29808

Dear Mr. Collier:


SUBJECT: POLLUTION PREVENTION LESSON

I would like to thank you for helping to enhance our curriculum by providing our guest speakers the week on the subject of pollution prevention. This is the second year that my students at Bel Air have been able to hear this presentation, and I was glad to hear that we would have the opportunity again. My second grade class thoroughly enjoyed the presentation, and it was presented in a way that made the goal of taking care of our resources relevant to their lives. Ms. Berry and Mr. Cruse were well prepared with their hands-on demonstrations that kept the attention of my class. We would enjoy having them return to Bel Air in the future. I am sure I will be recommending their presentation to teachers at other schools.

Sincerely,
Alicia G. Cruse
Alicia G. Cruse

Dear Ms. Berry,
When you came you showed us how you don't create wastes. That shocked me you made was great and I hope you were back soon. If you can come back, come back please.

PS Thanks, come back soon!
Your friend, Allie Bridges



10-9-2000
Attention: Mr. Tim Collier,
Mr. Santa Berry,
Ms. Caroline Cruse


Thank you for the class presentation on Pollution Prevention. It was very informative. The class enjoyed wearing the pins, and coloring at the coloring books. We couldn't get enough of the trail mix.

Thanks again for coming. We look forward to your return! Spent an other happy.

Sincerely,
Marvin Henderson

P.S. Here are some letters written by my second grade class.

Dear Ms. Berry,
I had fun.
It was fun when we made pins.
You taught me not to waste things!



Your friend,
Victoria

